

CLAIMS

What is claimed is:

1. A clutch assembly for rotatably connecting a motor vehicle engine crankshaft with a transmission input shaft, the clutch comprising:
 - a flywheel rotatably disposed on an axis of rotation;
 - a transmission input shaft disposed on the axis of rotation and having a splined portion;
 - a clutch cover fixed to the flywheel;
 - a pressure plate disposed between the clutch cover and the flywheel for axial movement therebetween and rotatably fixed to the cover;
 - a clutch driven disc rotatably fixed to the input shaft through the splined portion and disposed between the flywheel and the pressure plate for axially slidable movement therebetween;
 - a clutch release sleeve slidably and rotatably disposed on the input shaft having a first end disposed between the pressure plate and the cover and having a second end disposed on a side of the cover opposite the pressure plate;
 - a plurality of radially oriented levers distributed about the axis of rotation and having radially inwardly disposed ends engaging a first end of the release sleeve and the levers extending between the release sleeve and the pressure plate;
 - a spring disposed between the pressure plate and the cover biasing the pressure plate toward the driven disc;
 - a clutch release bearing assembly connected to a second end of the release sleeve and disposed outside the clutch cover and the clutch release bearing assembly also having an engagement surface, the clutch release bearing assembly having an outer non-rotational race separated from an inner race by bearing members;
 - a clutch housing disposed over the clutch cover and the release bearing;

- a clutch release shaft rotatably disposed in the clutch housing and pivotable about a second axis oriented at 90 degrees to the axis of rotation, the second axis being closer to the axis of rotation than the clutch release bearing assembly outer race;
 - a clutch release yoke rotatably fixed to the clutch release shaft for rotation therewith and having first and second forks extending adjacent to the release bearing assembly;
 - a plurality of bearing support shafts having a first end attached to an inboard side of said first and second forks and a second end having a retention flange; and
 - a plurality of bearing elements rotatably mounted on said bearing support shafts and engaging the engagement surface of the clutch release bearing.
2. The clutch as claimed in claim 1 wherein said bearing elements are retained in position respectively on said bearing support shafts using a snap ring.
 3. The clutch assembly of claim 1 wherein said roller bearings are retained in position respectively on said bearing support shafts by said retention flanges and said inboard side of said first and second forks.
 4. The clutch assembly of claim 1 wherein said bearing elements are roller bearings.
 5. The clutch assembly of claim 4, wherein said roller bearings are needle bearing.
 6. The clutch assembly of claim 4 wherein said roller bearings are bushings.
 7. The clutch assembly of claim 4 wherein said roller bearings are ball bearings.

8. The clutch assembly of claim 1 wherein said retention flange substantially covers an end portion of said bearing element.
9. A clutch release mechanism comprising:
 - a clutch release sleeve having a lever engagement feature at a first end and a rotational axis;
 - a clutch release bearing assembly engaging a second end of the clutch release sleeve and having an inner race rotatably fixed to the second end of the clutch release sleeve and having an outer nonrotational race separated from the inner race by a bearing member;
 - a clutch release yoke having rollers disposed respective bearing support shafts attached to each of two forks for engagement with the clutch release bearing assembly, the clutch release yoke having a pivotal axis closer to the rotational axis than the outer race and the yoke pivotal axis being forward of the bearing members when the clutch release bearing assembly is moved by the clutch release yoke to a released position; and
 - said bearing support shafts including retention flanges formed at one end of each of said support shafts for retaining said roller bearings.
10. A clutch release yoke for a driveline clutch comprising:
 - a bridge section hinged to rotate with respect to a clutch housing;
 - a plurality of forks extending from said bridge section;
 - a plurality of respective bearing support shafts attached to an inboard side of said forks; and
 - a plurality of respective bearing elements disposed on said bearing support shafts, said support shafts having a respective retention flange formed on an end opposite to said inboard side of said fork.
11. The release yoke of claim 10 wherein said bearing element is retained in position on said support shaft using a snap ring.

12. The release yoke of claim 10 wherein said bearing element is retained in position by said retention flange and said inboard side of said fork.
13. The release yoke of claim 10 wherein said bearing element is a roller bearing.
14. The release yoke of claim 13, wherein said roller bearing is a needle bearing.
15. The release yoke of claim 10, wherein said retention flange substantially covers an end of said roller bearing.
16. The release yoke of claim 10, wherein said roller bearings engage a clutch release bearing.
17. A roller assembly for use with a clutch assembly, secured in a coaxial fork shaft of a clutch yoke comprising:
 - a bearing element circumferentially disposed about an outer surface of a bearing support shaft; and
 - a bearing support shaft with a first end including a radially outwardly extended flange and a second end received within a corresponding opening of a yoke arm.
18. The roller assembly of claim 17 wherein the bearing element is a roller bearing including one of a needle bearing, a ball bearing, a sleeve bearing, and a plastic bearing.
19. The roller assembly of claim 17 wherein the roller assembly includes a positioning snap ring disposed between a plurality of aligned grooves in the bearing element.
20. The roller assembly of claim 17 wherein the bearing support shaft includes a threaded arrangement.